

Notes on the African Agromyzidae (Diptera) - 4

by

KENNETH A. SPENCER

19, Redington Road, London N.W.3, England

This paper is based mainly on material from South Africa. Part was collected by the author in November-December 1961, another part was collected by B. R. and P. Stuckenberg, mainly in the Drakensberg Mountains and a number of interesting specimens, including one new species described below, have been examined which were bred from their leaf-mines by Dr L. Vári. Some British Museum (Nat. Hist.) accession material has been studied and a few species from Kenya, Tanganyika and Ethiopia have also been considered.

Although 12 new species are described, a high proportion of material now coming to hand consists of known species. It is interesting to note the close affinities to Palaearctic species of the two new species *Phytoliriomyza immoderata* and *Napomyza drakensbergensis*, described from high altitudes in the Drakensberg; it was equally interesting to record in the Drakensberg two species *Cerodontha abyssinica* and *C. heringiella*, recently described from Addis Ababa (Ethiopia). A further case of affinity between South Africa and the Abyssinian Highlands is provided by *Phytomyza ranunculina* found by the author at Pietermaritzburg and recently also confirmed at Addis Ababa. In this case the variation in the specimens in the two areas is such that it appeared initially that distinct species were involved, but the male genitalia show conclusively that this is merely a significant example of geographical variation, of which few confirmed cases are known in the Agromyzidae.

The small black, epidermal miners of the genus *Melanagromyza* represent a particularly difficult problem, but the additional material I was able to collect has proved of great value in the further clarification of this group.

I would like to record here my gratitude to Dr H. K. Munro and to Mr and Mrs B. R. and P. Stuckenberg for their kind help with my collecting expeditions around Pretoria and Pietermaritzburg. I also wish to thank my wife for the time and care taken in preparing all illustrations in this paper; the scale line represents 0.1 mm, unless otherwise indicated.

Genus *AGROMYZA* Fallén, 1810

Agromyza abutilonis Spencer, 1959, fig. 1

KENYA: Nairobi, leaf-mines with some larvae but mostly already empty, found on *Abutilon mauritanium* (Jacq.) Medic., 23.xi.1961, K.A.S.. The upper surface linear mine is shown in fig. 1. A female caught on *Hibiscus flavifolius*

Ulbr. some miles north of Nairobi seems clearly referable to this species. Leaf-mines with larvae were found on the same plant, but no adults were reared.

NATAL: Pietermaritzburg, Town Bush, 6.xii.1961, one female on foliage of *Solanum mauritianum* Scop., K.A.S., is tentatively referred to this species. It must for the time being be assumed that this specimen was fortuitously resting on *Solanum* but the possibility cannot be excluded that it represents a distinct species with *Solanum* as host.

Agromyza catherinae Spencer, 1959

NATAL: Oribi Gorge Reserve, Unzimkulwana Valley, 21-28.xi.1960, two ♀ ♀, B. & P. Stuckenberg. The only other specimen known is the ♀-holotype from Wylies Poort, Zoutpansberg (Tvl.).

Agromyza graminivora Spencer, 1960, fig. 2

NATAL: Oribi Gorge Reserve, Umzimkulwana Valley, 21-28.xi.1960, three ♂ ♂, one ♀, B. & P. Stuckenberg; Pietermaritzburg, Town Bush, 6.xii.1961, one ♂, B. & P. Stuckenberg.

The aedeagus of a male from Oribi Gorge is shown in fig. 2 and is distinctively different from that of *A. pallidifrons*. It agrees closely with that of the holotype from Senegal, bred from "millet".

This species is readily distinguishable from *A. pallidifrons* by the black frons, stronger orbital bristles and the closer spacing of the *ors*.

Agromyza susannae Spencer, 1959 closely resembles *A. graminivora* but the squamal fringe is distinctly darker brown. The holotype is a female, from Nyasaland, and the species cannot at the moment be satisfactorily synonymised.

Agromyza ocularis Spencer, 1961, fig. 3

NATAL: Drakensberg, Giants Castle Reserve, 5800 ft., 18-23.ix.1961, one ♂, B. & P. Stuckenberg.

The only other specimen of this distinctive species is the ♀-holotype from Gydo Pass, Ceres District, W. Cape. The male is substantially smaller, with wing length of 2.1 mm. The aedeagus of this specimen is shown in fig. 3.

The species resembles the Palaearctic species *A. ocellaris* Hendel (cf. Hendel, 1936: 140), but there are distinctive differences in the male genitalia.

Agromyza pallidifrons Spencer, 1959, fig. 4

TRANSVAAL: Pretoria, leaf-mines found 4.xii.1961 on *Urochloa panicoides* Beauv., 22-25.xii.1961, one ♂ and two ♀ ♀, K.A.S. The larva feeds downwards forming a greenish blotch mine which entirely fills the leaf from the apex for a distance of some 3 cms.

The aedeagus of the bred male (fig. 4) is identical with that of a ♂-paratype from Elizabethville. It can now be established that the significant characters of this species are the dull brown frons, the slender orbital bristles and the conspicuously wide spacing of the two *ors*. The colour of the third antennal segment is variable and in the bred specimens it is largely black and only paler on the innerside. The mid-tibiae all have two bristles in these further specimens, not one as in the types.

Genus *MELANAGROMYZA* Hendel, 1920

One of the most difficult groups in this genus in Africa is that of the small black species with the costa ending at or slightly beyond vein r5 and the two segments of vein m4 equal. Most, but not all these species (cf. *M. clutiae*), are epidermal miners. Male genitalia have now been examined of specimens bred from *Coffea*, *Eugenia*, *Gymnosporia*, *Haemanthus*, *Passiflora*, *Rhamnus*, *Thunbergia*, *Tylophora*, and *Ziziphus* (Madagascar); epidermal mines have also been found on *Adenia*, *Bougainvillea*, *Cassia* and *Doryalis*.

The following facts can now be established:

1. The male genitalia of what for convenience will be termed the *passiflorae*-group of epidermal miners are all of basically the same type, quite distinct from any other group in the genus. Slight differences in the aedeagus tie up with minor differences in the adult and the differing host-plants.
2. The species feeding on *Coffea* is almost certainly not identical with *M. coffeae* (Koningsberger, 1897), described from Java. Unfortunately no specimen bred from coffee in the Oriental region can be traced, and no epidermal miner is known to the author from the Oriental region with the costa ending at vein r5. It is now believed that *coffeae* may be synonymous with *atomella* (Malloch, 1914), and possibly with *theae* (Green, 1896). This complex has recently been discussed in a paper on the Australian Agromyzidae (Spencer, in press).
3. The African coffee feeder appears to be identical with the species bred from *Passiflora*, *Eugenia* and *Tylophora*; the leaf miner noted on *Adenia*, *Bougainvillea* and *Doryalis*, but not yet bred is almost certainly the same species. This species is accepted as *passiflorae* Hering, 1957.
4. Séguy (1951) described a species of this group from Madagascar as *M. flacourtiae* which he considered to be highly polyphagous; the numerous host-plants recorded include coffee and tea. Without being able to examine the genitalia of specimens bred from a number of these host plants, it is not possible to be certain whether this species is identical with *passiflorae* or whether Séguy had before him, as seems likely, a species group.
5. *M. theae* has not been recorded in Africa. In this species the costa extends to vein m1 + 2 and the last segment of m4 is substantially shorter than the penultimate. The species was incorrectly included in the author's (1959) key, couplet 35a.

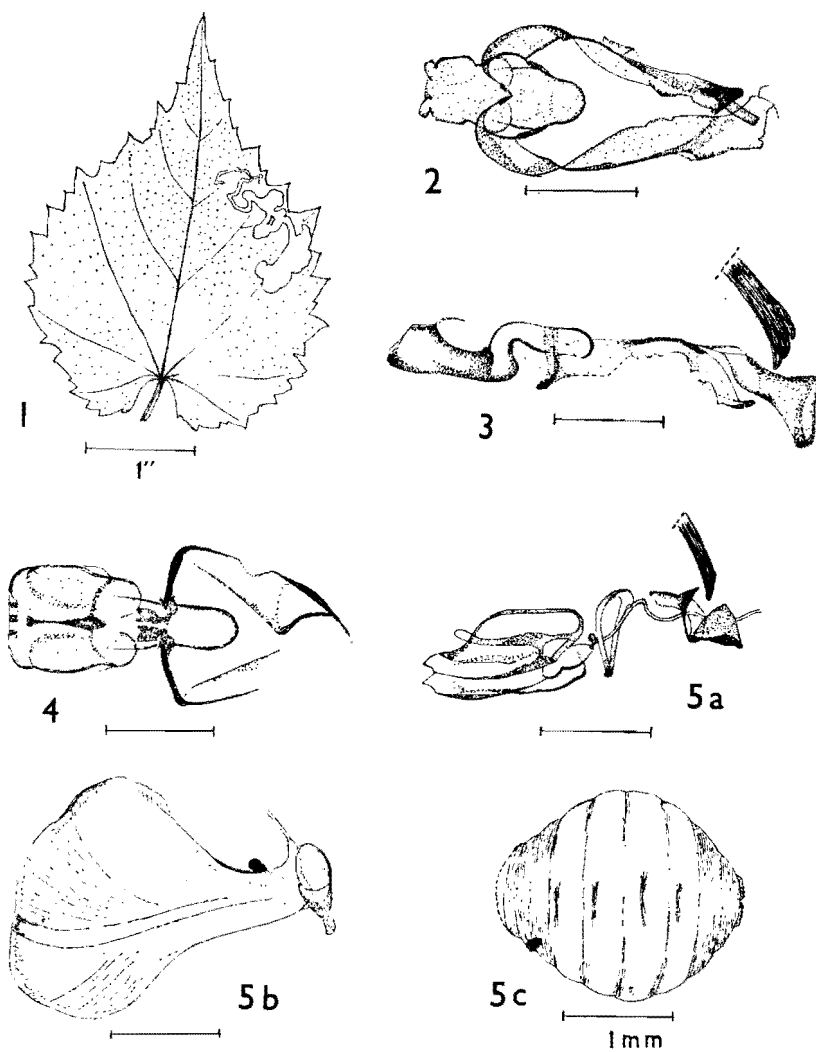


Fig. 1. *Agromyza abutilonis*: leaf-mine on *Abutilon mauritianum*. Fig. 2. *Agromyza graminivora*: aedeagus. Fig. 3. *Agromyza ocularis*: aedeagus, side view. Fig. 4. *Agromyza pallidifrons*: aedeagus. Fig. 5. *Melanagromyza acaciae*: a. aedeagus, side view; b. spermal sac; c. puparium.

33	Arista long, equal to vertical height of eye	33a
—	Arista shorter, equal to width of eye viewed in profile	34
33a	Mesonotum brilliantly shining black	<i>passiflorae</i> Hering
—	Mesonotum mat, blackish-brown	<i>gossypii</i> Spencer
34	Second <i>dc</i> distinctly behind level of supra-alar, first <i>dc</i> equidistant between suture and second <i>dc</i> ; jowls relatively broad, one-sixth height of eye; larva forming upper surface mine (not epidermal)	<i>clutiae</i>
—	Second <i>dc</i> at level of supra-alar, the distance between first and second <i>dc</i> about double that between first and suture; jowls narrow; larva forming epidermal mine	35
35	Third antennal segment with conspicuously long pubescence	36
—	Third antennal segment with normal pubescence	37
36	Frons only slightly less than twice width of eye; large species, wing length up to 2.4 mm	<i>haemanthi</i>
—	Frons less than one and a half times width of eye	<i>thunbergivora</i>
37	Mesonotum distinctly mat, somewhat shining from behind; epidermal miner, larva with posterior spiracles each having three bulbs	<i>cassinis</i> Hering, <i>gymnosporiae</i> Hering
—	Mesonotum shining black; non-epidermal miner, larva with posterior spiracles each having 15 bulbs	<i>ceratiosicyi</i> Hering

The larger greenish species represent a further complex group in Africa. A number of new species have been described since the key to this group was prepared (1959: couplets 24 to 28a) and it is felt it would be helpful to publish the revisions to these couplets as follows:

- | | | |
|-----|--|---|
| 24 | Squamal fringe distinctly ochreous-brown | ochrasquamata Spencer |
| — | Squamal fringe white | 24a |
| 24a | Very small species, wing length up to 2.1 mm | albisquama (Malloch)
(= leguminum Bezzi) |
| — | Larger species, wing length 2.2 mm or over | 25 |
| 25 | Jowls relatively broad, one-fifth to one-sixth height of eye | 25a |
| — | Jowls narrow, one-tenth height of eye | 27 |
| 25a | Medium-sized species, wing length 2.5-2.7 mm | 26 |
| — | Large species, wing length 2.8-3.4 mm; arista largely bare; eyes haired in male,
bare in female. (Larva in stems of <i>Senecio</i> species) | seneciocaulis Spencer |
| 26 | Arista conspicuously plumose. Gall-causer on <i>Solanum</i> species | solanidis Spencer |
| — | Arista appearing bare | 26a |
| 26a | Third antennal segment densely covered with long whitish pubescence | lindneri Spencer |
| — | Third antennal segment with normal pubescence | gerberae Spencer |

- 27 At least male with haired eyes 27a
 — Eyes bare in both sexes 28
 27a Large species, wing length 2.7-3 mm 27b
 — Smaller species, wing length 2.2-2.7 mm 27aa
 27aa Distal process of aedeagus covered with distinct sensory pores; mesonotum shining, greenish *metallica* (Thomson)
 — Aedeagus not so (1961c, fig. 8), mesonotum blackish-green. (Larva in flower-heads of *Inula glomerata*) *inulivora* Spencer
 27b Arista virtually bare. (Larva in stems of *Gerbera jamesonii*) . *gerberivora* Spencer
 — Arista conspicuously plumose 27c
 27c Lunule in form of semicircle; eye of female with conspicuous pilosity. No membranous gap between median and distal sections of aedeagus. Larva in flower-heads of *Senecio* species) *compositana* Spencer
 — Lunule narrower and higher; eye of female at most with very short, sparse hairs. Conspicuous membranous gap between median and distal sections of aedeagus *verdata* Spencer
 28 Large species, wing length 2.8-3.3 mm; mesonotum brilliantly shining-green. (Larva in seeds of *Thunbergia* species) *viridissima* Spencer
 — Smaller species, wing length 2.2-2.7 mm; mesonotum greenish-black or greenish-coppery 28a
 28a Mesonotum conspicuously olive-greenish, abdomen coppery [Larva in seeds of *Desmodium frutescens* (Mauritius)] *desmodii* Spencer
 — Mesonotum greenish-black or greenish-coppery 28b
 28b Wing length 2.4-2.7 mm. (Larva in seeds of *Vigna* species) . *vignalis* Spencer
 — Wing length 2.2 mm *damnata* Spencer

Melanagromyza acaciae spec. nov., figs. 5a-d

Head: frons equal to width of eye, not projecting above eye in profile; orbits well-defined, widening below; three equal *ors*, directed upwards, two similar incurved *ori*; all five orbital bristles conspicuously short and slender; orbital setulae short, sparse, reclinate, with one or two hairs in front incurved; ocellar triangle large and broad, apex extending to upper *ors*; lunule large, semicircular; jowls exceptionally narrow, little more than linear, with row of strong peristomal bristles but no differentiated vibrissa, eye large, oval, upright, with patch of whitish hairs in male at level of upper *ors*; third antennal segment conspicuously small, arista fine, bare but strongly thickened in lower quarter. *Mesonotum*: 2 + 0 *dc*, normal; *acr* in some 12 rows in front, six rows extending to level of first *dc*; inner post-alar small, similar to *acr*, intra-alar somewhat weaker than second *dc*. *Wing*: length 2—2.2 mm, costa well-developed to vein *m*₁ + 2, *rm* slightly beyond midpoint of discal cell, last segment of *m*₄ three-quarters length of penultimate. *Legs*: mid-tibia with two well-defined lateral bristles. *Colour*: head black, ocellar triangle brilliantly shining; mesonotum shining, distinctly bluish, abdomen with a variable coppery, greenish or purplish tinge; legs entirely black; wing normal, veins pale brown; squamae and fringe white, halteres brownish-black.

♂-*Genitalia*: aedeagus as illustrated (fig. 5a), ninth sternite with broad side arms and elongated hypandrial apodeme, spermal sac greatly enlarged, larger than aedeagus (fig. 5b).

Puparium: (fig. 5c), 2.2 mm long, at widest point on sixth segment 2 mm wide, thus nearly spherical, shining, reddish-brown; posterior spiracular processes (fig. 5d) adjoining, each with an ellipse of 12 buds surrounding a rudimentary black horn.

♂-*Holotype*: TANGANYIKA: Ardai, 8.ii.1961, bred ex thorn on *Acacia drepanolobium* Harms ex Sjöstedt; seven ♂- and three ♀-paratypes, three same data as holotype and seven Tanganyika, Arusha, 11.iii.1961, bred from same host-plant, B. Hocking. Holotype and five paratypes in coll. British Museum (Nat. Hist.), two retained by Prof. Hocking, one presented to Prof. E. M. Hering, Berlin, two in author's collection. The almost spherical puparium is unique among the Agromyzidae but the posterior spiracles, male genitalia and the adult are entirely typical of the genus.

Prof. Hocking writes of the biology of the species (private communication): "Eggs are laid at the tip of young thorns and larvae tunnel into the swollen bases of these".

The species can be included in couplet 23 of the author's (1959) key, extended as follows:

- 23 Frons broad, one and a half times width of eye; mesonotum distinctly matt.
Posterior spiracles of puparium each with 10 buds surrounding a minute horn
(1959: fig. 33) **lamborni** Spencer
- Frons narrower, equal to width of eye; mesonotum brilliantly shining . . . 23a
- 23a Ocellar triangle short, not reaching lower *ors*; arista pubescent . **caeruleana** Spencer
- Ocellar triangle large, brilliantly shining; apex almost reaching margin of lunule:
arista conspicuously fine and bare **acaciae**

This is a most interesting species, and I would like to thank Prof. Hocking for allowing me to describe it.

***Melanagromyza clutiae* spec. nov., figs 6a-b**

Head: frons broad, one and a half times width of eye, not projecting above eye in profile; four orbital bristles, the two *ors* slightly stronger than the *ori*, lower *ori* incurved; orbital setulae sparse, reclinate; ocellar triangle moderately shining, apex extending to level of lower *ors*; jowls relatively broad, deepest in centre below eye, one-sixth vertical height of eye; third antennal segment rounded, rather large, shortly pubescent, arista relatively short, equal to width of eye viewed in profile, appearing bare. *Mesonotum*: second *dc* slightly behind level of supra-alar, first *dc* equidistant between scutellar suture and second *dc*; *acr* in eight rows at second *dc*, only a few hairs extending behind. *Legs*: mid-tibiae without differentiated lateral bristles. *Wing*: length in female 2 mm, costa ending at vein *r*₅, first cross-vein well beyond centre of

discal cell, slightly more than own length from vein m_m , last and penultimate segments of m_4 equal. *Colour*: an entirely black species; frons mat, orbits slightly shining; mesonotum largely mat but somewhat shining from behind, abdomen brilliantly shining; squamae grey, fringe black.

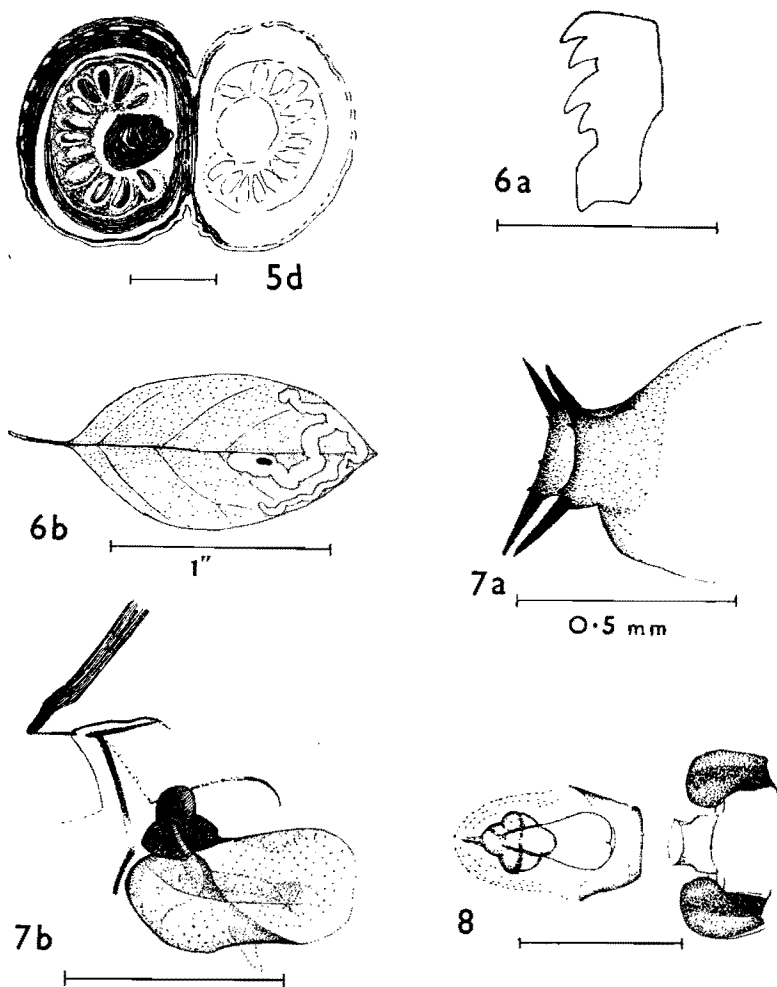


Fig. 5. *Melanagromyza acaciae*: d. posterior spiracles of puparium. Fig. 6. *M. clutiae*: a. larval mouth-hook; b. leaf-mine on *Clusia pulchella*. Fig. 7. *M. crotalariae*: a. posterior spiracles of puparium; b. aedeagus, side view. Fig. 8. *M. gymnosporiae*: aedeagus.

Larva: mouth-hooks (fig. 6a) of normal pattern, posterior spiracles each with three bulbs on small projection arising from common protuberance; puparium pale brown (darker, more blackish puparia proved to be parasitized).

Leaf-mine (fig. 6b): a whitish, upper surface linear mine with greenish-diffused frass; the puparium remains firmly glued to the leaf at the end of the mine.

♀ - Holotype: Kirstenbosch (C.P.), 12.xii.1961, ex leaf-mine found 26.xi.1961 on *Clutia pulchella* L., K.A.S., in author's collection.

It is surprising that this species should agree so very closely with the epidermal miners of the *gymnosporiae-thunbergivora* group, when the larva is so very distinct. It will be interesting to discover whether this similarity also extends to the male genitalia.

Melanagromyza crotalariae Hering, 1957, figs. 7a-b

TRANSVAAL: Pretoria, garden of National Herbarium 4.xii.1961, young leaf-mines on *Crotalaria capensis* Jacq., one male emerged 19.xii.1961, K.A.S.. Johannesburg, The Wilds, 5.xii.1961, leaf-mines on same host-plant, one female emerged 20.xii.1961, K.A.S..

The distinctive posterior spiracles of the puparium are shown in fig. 7a. The male genitalia show the species to be related to *M. centrosematis* de Meij. (Spencer, 1961a: figs. 2a and c). The ninth sternite has the same rounded hypandrial apodeme and the basiphallus is similarly asymmetrical. The distiphallus, however, is distinctive, with a conspicuous black process above (fig. 7b). The spermal sac is unusually large and longer than the entire aedeagus. The surstyli terminate in a row of strong bristles.

Melanagromyza gymnosporiae Hering, 1957, fig. 8

CAPE PROVINCE: Kirstenbosch and Hout Bay, leaf-mines abundant on *Gymnosporia buxifolia* (L.) Szyszl., 26.xi.1961, K.A.S..

NATAL: Umhlanga Rocks, nr. Durban, leaf-mines infrequent on *Gymnosporia* species, 8.xii.1961, K.A.S..

The epidermal leaf-mine develops into a characteristic whitish blotch and invariably the mine is formed on both upper and lower surfaces of the leaf. The small black puparium is consistently located at the base of the leaf beside the mid-rib.

The aedeagus of the holotype is illustrated in fig. 8. The distiphallus is conspicuously darker than in the other species of the group (figs 10, 11 and 12a).

It is believed that *M. cassinis* Hering, 1957, is synonymous with *gymnosporiae* but this synonymy cannot be formally established until more material of *cassinis*, including males and leaf-mines, is available.

Three specimens bred from *Rhamnus prunoides* L'Hérit. at Hennops River (Tvl.), L. Vári, are almost certainly referable to this species. The aedeagus is extremely similar but is still darker, including even the basiphallus.

Melanagromyza gymnospirivora spec. nov., figs. 9a-b

Head: frons broad, slightly over one and a half times width of eye, orbits differentiated and distinctly projecting above eye in profile; four strong, equal orbital bristles, the upper *ors* reclinate, the lower *ors* and both *ori* slightly incurved; orbital setulae irregular, rather long, incurved in front, reclinate behind; ocellar triangle only weakly differentiated; lunule large, broad, higher than semicircle; jowls rounded, deepest in centre below eye, about one-quarter vertical height of eye, cheeks forming narrow, well-defined ring below eye; peristomal hairs strong, irregular, vibrissa normally well-developed; third antennal segment small, rounded, arista conspicuously fine and bare but thickened at base, narrow keel dividing base of antennae. *Mesonotum*: two *dc*, second rather weak, well behind level of supra-alar; intra-alar strong, similar to second *dc*; inner post-alar slight; *acr* thick, in some 10 rows in front, at least four rows extending to first *dc*. *Wing*: length in male 2.3, in female 2.6-2.8 mm; costa extending strongly to vein *m*₁ + 2, discal cell large with vein *rm* just beyond midpoint, *m*₄ segments variable, last segment either slightly shorter or slightly longer than penultimate. *Legs*: mid-tibiae with two differentiated lateral bristles. *Colour*: frons mat, sooty black; orbits conspicuously shining, ocellar triangle less so; lunule more grey; mesonotum and abdomen distinctly shining black, though not brilliantly, without any metallic sheen; wings clear, veins dark, paler, brownish-orange at base; squamae and fringe white, margin brownish-orange.

♂-*Genitalia*: aedeagus small, as illustrated (fig. 9a), ninth sternite with side-arms broadly fused at apex, spermal sac large, oval, somewhat longer than entire aedeagus.

♂-Holotype: Hout Bay (C.P.), emerged 10.xii.1961 from galls on twigs of *Gymnosporia buxifolia* (L.) Szyszl. found 26.xi.1961; two ♀-paratypes: Kirstenbosch, emerged from galls on same host-plant on 14 and 23.xii.1961, K.A.S.. Holotype and paratypes in author's collection.

Galls of this species were previously recorded from Hout Bay (Spencer, 1960: 27). I was able to collect them in large numbers from this locality and also at the Botanical Gardens, Kirstenbosch. A dozen or more frequently occur together towards the apex of young shoots (fig. 9b).

These galls somewhat resemble those of the widespread European species, *M. simplicoides* Hendel, 1936, occurring on twigs of *Salix* species.

The species can be included in the author's (1959) key, as extended (1960), by a further extension, as follows:

- 7 Squamal fringe distinctly ochrous, almost brown; cheeks broad; jowls one-third height of eye; arista bare *cotyledonus* Spencer

- Squamal fringe white; cheeks narrow, jowl at most one-quarter height of eye 7a
 7a Arista plumose *rutshurensis* Spencer
 — Arista bare *gymnosporivora*

Melanagromyza haemanthi spec. nov., fig. 10

Adult: extremely similar to *M. thunbergivora* described below, distinguishable as follows: substantially larger, wing length 2.3-2.4 mm, frons exceptionally broad, almost twice width of eye viewed from above, orbital setulae conspicuously long in front at level of *ori*.

♂-*Genitalia*: aedeagus and surstyli as illustrated (fig. 10), margins of basiphallus produced to level of rounded processes beside distiphallus, surstyli broader.

Leaf-mine: whitish, epidermal, distinctly linear, up to 6" in length, without distinct frass; puparium, white below, brownish above, remaining in mine; favoured point of pupation at base of leaf; three bulbs on each posterior spiracular process, similar to *thunbergivora* but larger.

♂-*Holotype*: Umhlanga Rocks, nr. Durban, 21.xii.1961, in remnant of coastal tropical forest, bred ex leaf-mine on *Haemanthus magnificus* Herbert (Amaryllidaceae) found 8.xii.1961; one ♂, two ♀-paratypes, 19-20.xii.1961, same data, K.A.S.. All types in author's collection.

This is the only described African species of the genus with a host-plant in the Monocotyledons.

Melanagromyza natalensis Spencer, 1959

NATAL: Pietermaritzburg, Town Bush, 6.xii.1961, one ♀, K.A.S..

Only two other specimens have been recorded, both from Natal.

Melanagromyza passiflorae Hering, 1957

Melanagromyza coffeae Hering, 1951, nec *coffeae* (Koningsberger, 1897), *syn. nov.*

The significant feature of this species is the conspicuously long arista which is equal to the vertical height of the eye.

No difference has been found in either adult or male genitalia of specimens bred from *Passiflora* (Cameroons) (fig. 11), *Coffea* (Kenya), *Eugenia* (Kenya) and *Tylophora* (Natal). *M. gossypii* Spencer, 1959, from Nigeria has a significantly less shining mesonotum and appears to be a distinct species, but this should be re-considered whenever additional material becomes available.

Melanagromyza provecta de Meij., 1910

M. communis Spencer, 1959, *syn. nov.*

The ♀-holotype from Java in the Zoological Museum, Amsterdam, is the only available type material of this species.

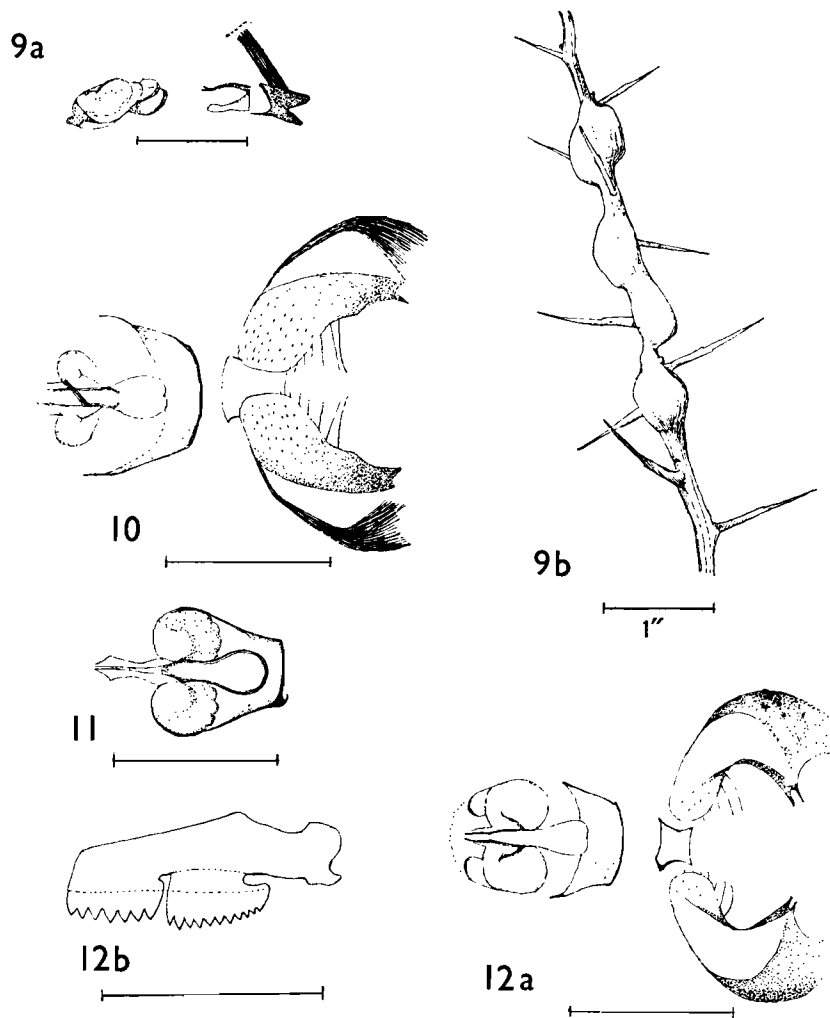


Fig. 9. *Melanagromyza gymnosporivora*: a. aedeagus, side view; b. galls on *Gymnosporia buxifolia*. Fig. 10. *M. haemanthi*: aedeagus and surstyli. Fig. 11. *M. passiflorae*: aedeagus. Fig. 12. *M. thunbergivora*: a. aedeagus and surstyli; b. larval mouth-hook.

I have recently examined the genitalia of a male from Flores (Rensch, Sunda Expedition) which agrees exactly with the holotype and can be accepted as conspecific with it; the distinctive aedeagus is identical to that of *M. communis* Spencer from Abyssinia, illustrated by Spencer (1961b: fig. 1). The specimens agree in all other respects and *communis* is therefore synonymised with *provecta* herewith.

Conformed specimens of *provecta* have recently been recorded from Moçambique (Spencer, 1961c, as *communis*) and also from Mt. Selinda, S. Rhodesia, 3,800 ft., 12.vi.1911, C. F. M. Swynnerton, in coll. British Museum (Nat. Hist.).

Melanagromyza seneciocaulis Spencer, 1960

NATAL: Oribi Gorge Reserve, Umzimkulwana Valley, 21-28.xi.1960, two ♂, one ♀, B. & P. Stuckenberg. Pietermaritzburg, Town Bush, one ♂, one ♀, bred from stems of *Senecio pterophorus* DC, 6.xii.1961, K.A.S.. Some of these specimens are somewhat smaller than those seen hitherto and with wing length of 2.7 mm the species is not readily distinguishable from *M. gerberae* Spencer, 1960.

Melanagromyza thunbergivora spec. nov., figs 12a-c

Head: frons just less than one and a half times width of eye, not projecting above eye in profile; four equal orbital bristles, the two *ors* and upper *ori* directed upwards, lower *ori* incurved; orbital setulae short, sparse, reclinate; apex of ocellar triangle extending to lower *ors*; jowls very narrow, rounded; third antennal segment with conspicuous upturned pubescence, arista equal to width of eye viewed in profile, appearing virtually bare; eye in male with scattered hairs. *Mesonotum*: second *dc* at level of supra-alar, distance between first and second twice that between first and suture. *Legs*: mid-tibiae without differentiated bristles. *Wing*: length in male 2 mm; costa ending just beyond apex of vein r₅, first cross-vein three-quarters distance from base of discal cell, slightly more than own length removed from vein m, last segment of m₄ slightly longer than penultimate. *Colour*: an entirely black species; frons mat, ocellar triangle and orbits weakly shining, mesonotum distinctly shining but more mat from front, abdomen shining, squamae dark grey, fringe black.

♂-*Genitalia*: aedeagus and surstyli as illustrated (fig. 12a), distinct gap between basiphallus and the two rounded processes beside the distiphallus.

Larva: mouth-hook with the characteristic modification of the epidermal miners, with six serrations above and nine below (fig. 12b); posterior spiracular processes each bearing three bulbs on a short black projection arising from a central protuberance.

Leaf-mine: (fig. 12c): linear, with distinct patches of greenish frass, brownish puparium remaining in leaf at end of mine.

♂-Holotype: Pietermaritzburg, Town Bush, 13.xii.1961, from leaf-mine on *Thunbergia natalensis* Hk. found 6.xii.1961; one ♀-paratype emerged 19.xii.1961, K.A.S., both in author's collection.

Melanagromyza vignalis Spencer, 1959, fig. 13

The aedeagus of a specimen bred from *Glycine* species at Pietermaritzburg, 31.iii.1954, R. I. Phelps is shown in fig. 13. The distiphallus is distinctive, with the lower tubular process lying conspicuously asymmetrically on the left side of the aedeagus. This arrangement appears to be constant and has also been noted in specimens from Kenya.

Melanagromyza vigneae Séguy, 1951, fig. 14

The aedeagus of a male bred from *Vigna unguiculata* Walp. from Sénégal, Bambey is shown in fig. 14. The distiphallus is somewhat similar to that found in the epidermal miners but the distinctive basiphallus suggests that this species does not belong to this group.

It is desirable to check the genitalia of the type series from Madagascar to confirm that the Sénégal specimens have been correctly identified.

Melanagromyza viridissima Spencer, 1959

GHANA: inland from Accra, on M'sawan Road, 27.xii.1920, one ♂, J. W. Scott-Macfie, in coll. British Museum (Nat. Hist.).

Melanagromyza species

RHODESIA: Salisbury, April 1961, one ♀, bred from cauliflower stem, (*Brassica*) in coll. British Museum (Nat. Hist.).

The species closely resembles *M. gerberivora* Spencer, but it is believed to represent a new species. Specimens bred from stems of *Brassica alboglabra* L. H. Bailey from Singapore, Malaya, 5.xi.1960 appear to be the same species but these were also females. Confirmation of the status of these specimens from examination of male genitalia should be awaited before the species can be described as new.

Melanagromyza species, fig. 15

TRANSVAAL: Pretoria, 3.xii.1961, puparia in leaf-stalks of *Cussonia* species (Araliaceae), H. K. Munro.

The posterior spiracular processes are shown in fig. 15. Two stout projections with a common base are surmounted by an ellipse of nine well-chitinized buds enclosing an indistinct scar, replacing the horn frequently found here in this genus.

Melanagromyza species, fig. 16

NATAL: Pietermaritzburg, Town Bush, 6.xii.1961, one ♂, K.A.S., indistinguishable morphologically from *M. inulivora* Spencer, 1961c.

The aedeagus of this specimen, illustrated in side view in fig. 16, shows that this represents a new species. However, it seems desirable to await additional material before this is formally described.

Genus *OPHIOMYIA* Braschnikov, 1897

Ophiomyia atralis (Spencer, 1961)

It was suggested (Spencer, 1961c: 335) that this species occurred in Kenya, feeding in stems and roots of *Striga hermonthica* Benth. Subsequently I bred the species from stem-mines on *Vernonia cinerea* L. at Calcutta airport and found identical mines on the same host at Darwin, Australia. There was no doubt whatsoever that these specimens were conspecific with others studied from Micronesia and the types from Indonesia, and I had also found the same mines at Bangkok.

It now seemed unlikely that a species occurring widely throughout the Oriental region to Australia and Micronesia on *Vernonia* would be the same as that feeding on *Striga* in Kenya. I have therefore re-examined all specimens and I am satisfied that those from *Striga* represent a new species described below.

Ophiomyia strigalis spec. nov., figs 17a-e

Head: (fig. 17a), frons 1.3 times width of eye, slightly projecting above eye in profile; two *ors*, only slightly stronger than the two *ori*, orbital setulae fine, reclinate; ocellar triangle conspicuous, apex at level of lower *ors*; jowls relatively broad, one-fifth to one-sixth vertical height of eye, distinctly projecting in front, forming an angle of 90°, vibrissa similar to lower *ori*; third antennal segment round, with short pubescence, arista conspicuously fine but thickened at base; facial keel dividing bases of antennae narrow, flat. **Mesonotum:** Second *dc* distinctly behind level of supra-alar, *acr* irregularly in some eight rows in front, only a few scattered hairs reaching level of first *dc*. **Wing:** length from 1.9 mm in male to 2.3 mm in female, costa extending strongly to vein *m* 1 + 2, *rm* slightly beyond midpoint of discal cell, last and penultimate segments of *m*4 equal. **Legs:** mid-tibia without differentiated lateral bristles. **Colour:** frons mat black, ocellar triangle and orbits distinctly shining; mesonotum greyish-black, mat viewed from front, more shining from behind; abdomen strongly shining black; squamae and fringe silvery-white, margins only slightly differentiated, pale brownish.

♂-**Genitalia:** aedeagus (fig. 17b) with elongated side-arms of basiphallus found in many species of the genus, distiphallus a complex agglomeration of

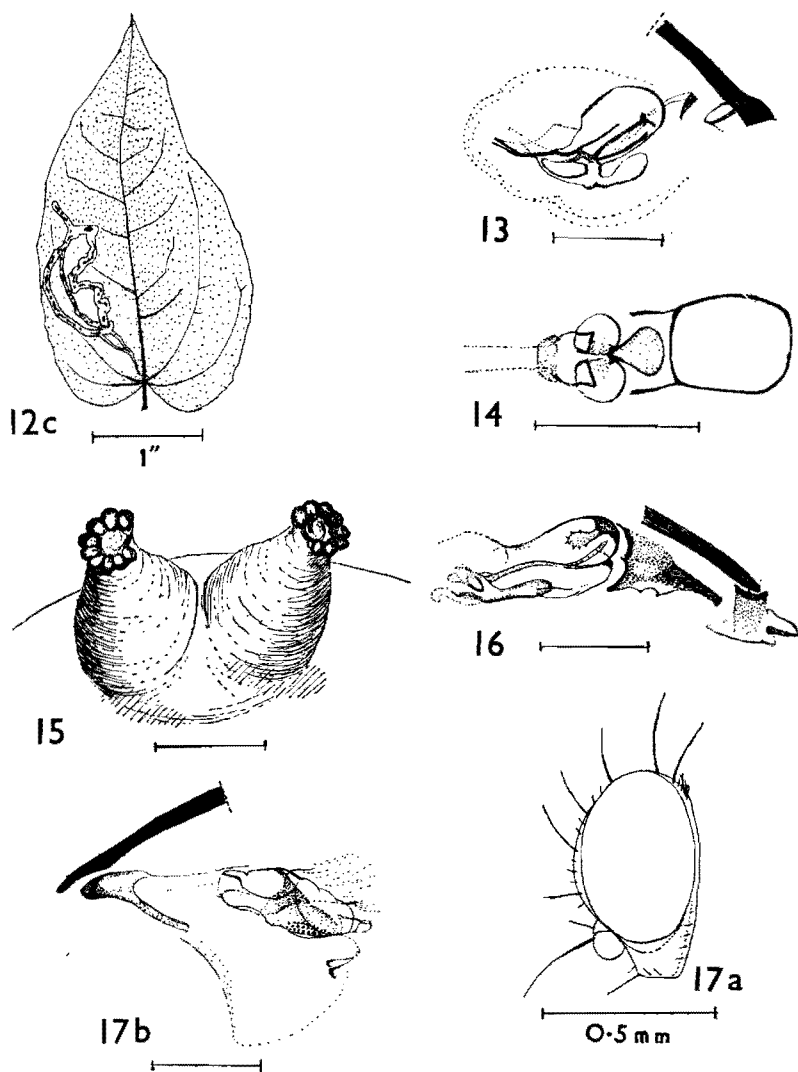


Fig. 12. *Melanagromyza thunbergivora*: c. leaf-mine on *Thunbergia natalensis*. Fig. 13. *M. vignalis*: aedeagus. Fig. 14. *M. vigneae*: aedeagus. Fig. 15. *Melanagromyza* species (*Cussonia*): posterior spiracles of puparium. Fig. 16. *Melanagromyza* species (Pietermaritzburg): aedeagus, side view. Fig. 17. *Ophiomyia strigalis*: a. head; b. aedeagus, side view.

sacs with a distinct patch of well-defined sensory pores below; ninth sternite with conspicuously rounded hypandrial apodeme (fig. 17c); spermal sac fan-shaped (fig. 17d); surstylus ending in three small teeth (fig. 17e).

♀ - Holotype: KENYA: Kibos, ex roots *Striga hermonthica* Benth., Sept. 1960, Scott Agr. Lab.; ♂ - allotype, one ♂ - and one ♀ - paratype, same data. Holotype and allotype in coll. British Museum (Nat. Hist.), two paratypes in author's collection.

The species was included in an extension to the author's (1959) key as *atralis* (Spencer, 1961c: 335) and is readily distinguishable from all other species known in Africa. The main differences from *atralis* are the broader jowls and more shining and differentiated orbits. The genitalia of *atralis* are closely similar but the distiphallus is less complex and without the conspicuous sensory pores, the hypandrial apodeme of the ninth sternite is shorter, and the spermal sac is smaller and more oval.

Ophiomyia rhodesiensis Spencer, 1959, figs 18a-b, 19a-b

It has recently been suggested by J. A. Whellan in Southern Rhodesia that this species might be synonymous with *O. lantanae* (Froggatt, 1919). I have therefore re-examined the holotype of *O. rhodesiensis* Spencer and compared it with specimens of *lantanae* from Kenya, India and Australia.

I am now fully satisfied that *rhodesiensis* is a good species. It was separated from *lantanae* in my (1959) key to the Ethiopian species by the relative width of jowls and cheeks, the proportions being given as one-quarter the vertical height of eye in *rhodesiensis* and one-sixth in *lantanae*. The depth of jowl appears to be somewhat variable in *lantanae* and is certainly usually narrower than in *rhodesiensis*, but this is not a really satisfactory character for separating the species. In *lantanae* the facial keel is normally more bulbous than in *rhodesiensis*, forming an almost spherical projection below the base of the antennae, but this character is also somewhat variable and in a small number of specimens the keel is less pronounced, closely approaching that of *rhodesiensis*. A character by which the species can immediately be separated is the vibrissal horn in the male, which in *rhodesiensis* consists of three bristles, fused at their midpoint and then sharply bending upwards (fig. 18a); in *lantanae* there is a single, substantially longer bristle, also with a characteristic upward curvature (fig. 18b). *O. rhodesiensis* also appears to be a larger species, with wing length of 2.4 mm; in *lantanae* the wing length varies from 2 to a maximum of 2.2 mm.

The aedeagus and spermal sac of *lantanae* have been illustrated by Spencer (in press: fig. 34, a, b). The aedeagus of *rhodesiensis* is complex, highly asymmetrical and difficult to illustrate satisfactorily but is clearly distinct from that of *lantanae*; the ninth sternite is stouter, far more strongly chitinized, almost black, but with a less elongated hypandrial apodeme; the spermal sac is distinctive, broader and far stouter than in *lantanae*; the surstyli are substantially larger, bearing a row of some ten short but strong teeth (fig. 19a), while in *lantanae*, the teeth are replaced by two fine hairs (fig. 19b).

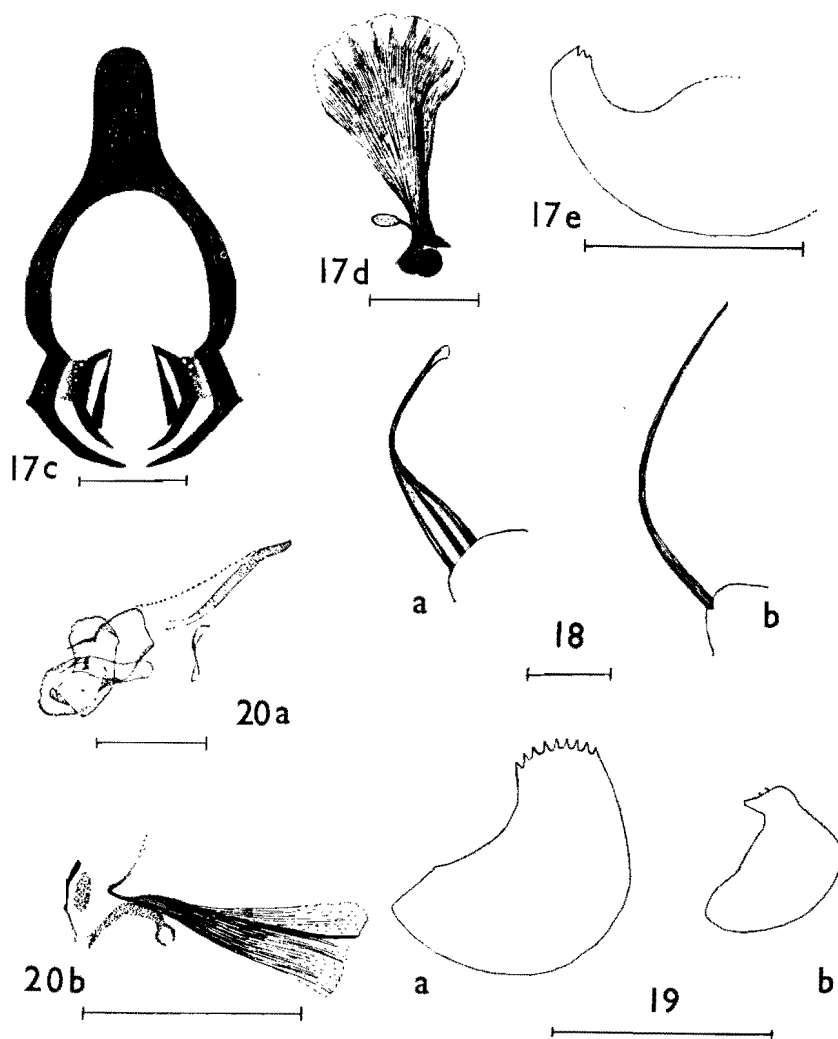


Fig. 17. *Ophiomyia strigalis*: c. ninth sternite; d. spermal sac; e. surstylus. Fig. 18. Vibrissal horn of a. *Ophiomyia rhodesiensis*; b. *O. lantanae*. Fig. 19. Surstylus of a. *O. rhodesiensis*; b. *O. lantanae*. Fig. 20. *Ophiomyia solanivora*: a. aedeagus, side view; b. spermal sac.

Ophiomyia solanivora Spencer, 1961, figs. 20a-c

TRANSVAAL: Louis Trichardt, bred from leaf-mines on unidentified plant, 25.iv.1955, two ♂♂, two ♀♀, L. Vári, Ac. No. 1640.

These specimens have been compared with a ♂-paratype, bred from *Solanum indicum* L. in Madagascar, and they are identical both morphologically and in the male genitalia.

The species has a distinctively bending vibrissal horn in the male, a very narrow facial keel, the last and penultimate segments of vein m₄ equal and characteristically whitish-grey squamae with an ochreous fringe.

The aedeagus (fig. 20a) ends in a complicated agglomeration of sacs and the basiphallus is asymmetrical, largely membranous on one side; the ninth sternite has strong side arms which broadly fuse apically, with a short hypandrial apodeme; the spermal sac (fig. 20b) is small and narrow; the surstyli end in a row of strongly developed teeth (fig. 20c).

This is an interesting additional species common to Madagascar and South Africa.

Ophiomyia species

NATAL: Montebello region (Ndwedwe Distr.), 1.x.1961, one ♀, B. and P. Stuckenberg, in coll. Natal Museum.

It is believed that this specimen represents an undescribed species but it is suggested that the formal description should best wait until a male is available. In the author's (1959) key the species runs to *O. rhodesiensis* but is readily distinguishable by the entirely rounded jowls, which do not project in front.

The essential characteristics of the species are as follows:

Frons one and a half times width of eye; orbital setulae reclinate above, incurved in front; jowls one-quarter height of eye, deepest in centre below eye; facial keel relatively broad, distinctly bulbous below base of antennae; arista short but distinctly pubescent; mesonotum and abdomen shining black; squamae grey, fringe black; wing length 2.2 mm in female, last segment of vein m₄ only slightly shorter than penultimate, in ratio 19 : 20.

Genus *CERODONTA* Rondani, 1861

Cerodontha abyssinica Spencer, 1961

NATAL: Oribi Gorge Reserve, Umzimkulwana Valley, 21-28.xi.1960, two ♀♀, B. & P. Stuckenberg. Drakensberg: Cathedral Peak Forestry Reserve, Organ Pipes Pass, at summit, *Erica* consocias, 9,600 ft., March 1959, one ♀, B. & P. Stuckenberg; Van Reenen, 1-22.i.1927, one ♀, R. E. Turner. CAPE PROVINCE: Somerset East, 10-22.xii.1930, two ♀♀, R. E. Turner.

The only other specimens known are the type series from near Addis Ababa (Ethiopia); these additional records are an interesting extension of the range of the species.

Cerodontha heringiella Spencer, 1961

NATAL: Drakensberg, Cathedral Peak Forestry Reserve, Organ Pipes Pass, at summit, *Erica consocioides*, 9,600 ft., March 1959, two ♂♂, four ♀♀, B. & P. Stuckenberg.

The only other specimens known are the type series from near Addis Ababa (Ethiopia).

Genus *PHYTOBIA* Liou, 1864

I have recently described *Phytobia* (*Dizygomyza*) *poëmyzina* from Australia (Spencer, in press) and at the same time carefully re-examined the closely related European species *caricivora* Groeschke, *scutellaris* (v. Ros.), (cf. Hendel, 1936), *angulata* (Loew) (= *semiposticata* Hend.) (cf. Hendel, 1936) and also the African specimens I had earlier referred to *caricivora* (Spencer, 1959: 303).

These species were placed in the sub-genus *Poëmyza* Hendel of *Phytobia* Liou, sensu Frick, 1952, on the basis of their characteristic lunule. This is higher than a semicircle, although not as high and narrow as in typical *Poëmyza* species, and there had previously been some doubt as to whether the species properly belonged in *Poëmyza* or *Dizygomyza* Hendel, s.s. This problem has now been solved by Nowakowski (in press), who has found no significant difference between the genitalia of the two subgenera and is combining them.

The morphological differences between the species in this group of leaf-miners on Cyperaceae are extremely slight but there are significant differences in larva and puparium and also in their biology. I have now found that the differences in the male genitalia, although slight, are constant.

Following examination of the genitalia of the African specimens I am now satisfied that these represent a distinct species, which can best be defined by referring to differences from the other species of this group.

I have included below a translation of the description of the larva of this species, which was prepared by de Meijere in 1940 before the adults had been examined.

Phytobia (*Dizygomyza*) *cariciphaga* spec. nov., fig. 21

Imago: Legs with tibiae and tarsi brownish, paler than black femora, distinguishing the species from *scutellaris*; knees on fore-femora distinctly yellow, on other legs quite black, similar to *caricivora* and *scutellaris* but distinct from *angulata* where the knees on f2 and f3 are distinctly yellowish, at least apically; mesonotum slightly more shining black than in related species; scutellum distinctly paler than mesonotum, almost brownish; wing length 2.7 mm, similar to *scutellaris* and *angulata*, smaller than *caricivora*.

♂-Genitalia: aedeagus (fig. 21) with tubules of distiphallus relatively short and straight, in related species longer, more curving.

Larva: as described by de Meijere (1940: 174): "Mouth-hooks each with two teeth, alternating regularly. Cephalo-pharyngeal skeleton black, unpaired section straight, relatively long, the upper arms brown, black only at base, the lower arms only half length of upper. Tubercle band narrow, inconspicuous, consisting entirely of very closely adjoining, colourless, scale-like, transverse-oval tubercles. Anterior spiracles broad, each with about 13 bulbs along edge. Posterior spiracles each with three bulbs, the end bulb bending, hook-like, the other two short, only slightly projecting, at base of each process, below a triangular black area with triangular tubercles. Puparium red, with indistinct segment boundaries."

♂-Holotype: CAMEROONS, grassland above Mannesquelle Hut, near Calvo crater 2500 m., bred ex *Carex* species, April 1938, H. Buhr; holotype and 17 paratypes in coll. Zoologisches Museum der Humboldt-Universität, Berlin; two paratypes presented to British Museum (Nat. Hist.), two presented to Natal Museum, Pietermaritzburg, eight in author's collection.

The five species in this group can be separated as follows:

- 1 Last segment of m4 one and a half times length of penultimate, discal cell small **poëmyzina** Spencer (Australian)
- Last and penultimate segments of m4 normally equal 2
- 2 Tibiae and tarsi black, similar to femora **scutellaris** (v. Ros.) (Palearctic)
- Tibiae and tarsi brownish, paler than femora 3
- 3 Large species, wing length 3-3.5 mm **caricivora** Groschke (Palearctic)
- Smaller species, wing length 2.7 mm 4
- 4 All femora slightly yellow distally, mesonotum largely mat.
- **angulata** (Loew) (Holarctic, Neotropical)
- Only fore-femur yellow distally, mesonotum distinctly shining **cariciphaga** Spencer (Ethiopian)

Phytobia (*Poëmyza*) *aristella* Spencer, 1961, fig. 22.

NATAL. Oribi Gorge Reserve, Umzimkulwana Valley, 21-28.xi.1960, one ♂, one ♀, B. & P. Stuckenberg.

The only other known specimen is the ♀-holotype from Zululand. The aedeagus of the male from Natal (fig. 22) is entirely typical of the sub-genus but exceptionally long.

Phytobia (*Calycomyza*) *gigantissima* Spencer, 1959

TRANSVAAL: Pretoria, 3.xii.1961, one ♀, K.A.S..

The only other records of this fine species are from the Congo (Spencer, 1959: 304) and from East London (C.P.), (Spencer, 1960: 32).

The fourth pre-sutural *dc* is strongly developed and the species perhaps properly belongs in the sub-genus *Trilobomyza*; as the genus is being revised, it is not considered desirable to make any change in generic placing at the present time.

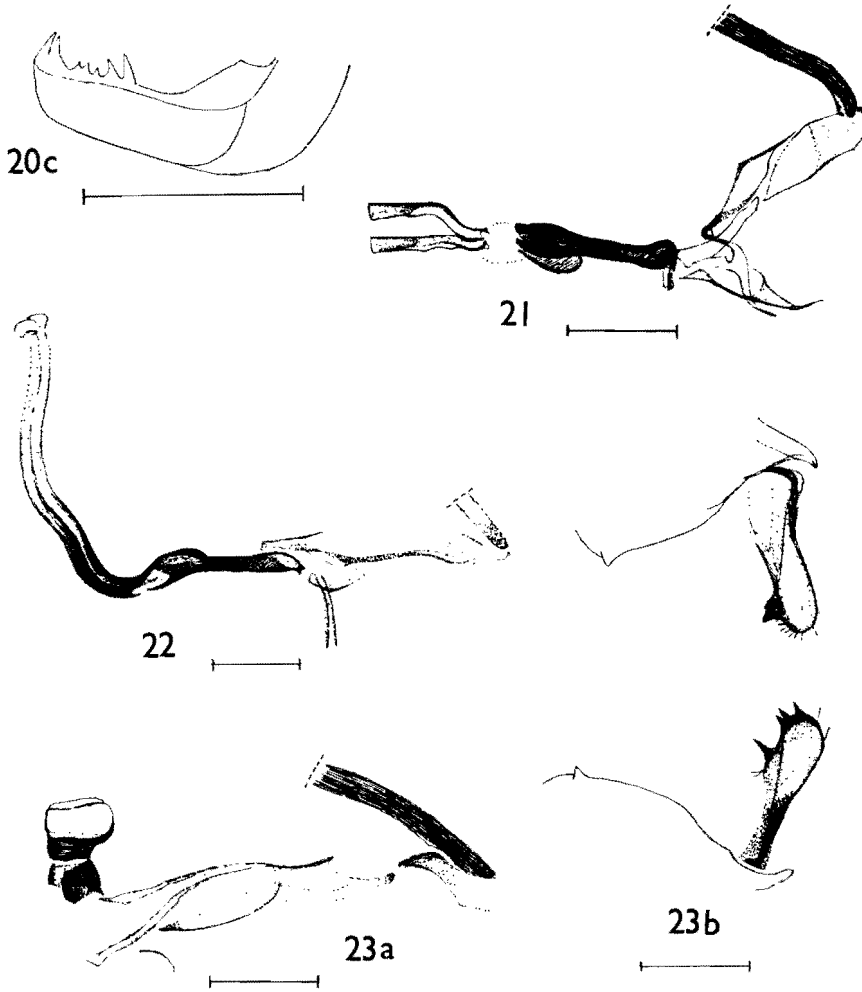


Fig. 20. *Ophiomyia solanivora*: c. surstylus. Fig. 21. *Phytobia (Dizygomyza) cariciphaga*: aedeagus, side view. Fig. 22. *Phytobia (Poemyza) aristella*: aedeagus, side view. Fig. 23. *Liriomyza mirifica*: a. aedeagus, side view; b. surstyli.

Genus *LIRIOMYZA* Mik, 1894*Liriomyza mirifica* spec. nov., figs. 23a-b

Head: frons exceptionally broad, twice width of eye viewed from above, strongly projecting above eye; orbits raised, conspicuously differentiated; two *ors*, the lower distinctly stronger, two (on one side three) *ori*; orbital setulae irregular, reclinate; lunule small, narrow, sunk below orbits; jowls exceptionally broad, deepest at rear, half vertical height of eye; cheeks forming broad ring below eye; third antennal segment large, longer than broad, rounded at end, without distinct pubescence, arista thickened in lower third, relatively short. **Mesonotum:** 3 + 1 strong *dc*, third and fourth equal; *acr* irregularly in some six rows. **Wing:** length in male 4.4 mm (lower half damaged, m4 proportions not detectable). **Colour:** frons, jowls and face yellow; orbits entirely black from vertex to base of antennae, both *vti* and *vte* on black ground; first and second antennal segments yellow, third distinctly darkened, brown; mesonotum mat black, with yellow patches at hind corners; scutellum bright yellow centrally, black at sides; humeral callus black centrally, notopleural area yellow with small black patch below anterior bristle, other pleura largely black but all margins yellow; coxae and femora predominantly yellow but with variable black markings, tibiae and tarsi dark brown; abdomen black.

♂-**Genitalia:** aedeagus as illustrated (fig. 23a); surstyli distinctive, with hairs and strong, irregular teeth at end (fig. 23b).

♂-**Holotype:** UGANDA, Ruwenzori Range, Namwanda Valley, 10,200 ft., December 1934-Januari 1935, F. W. Edwards B.M. East Africa Expedition, in coll. British Museum (Nat. Hist.).

This is one of the largest *Liriomyza* species in the world, and specimens of comparable size are only known from South America. It can be included in the author's 1959 key as follows:

- 3a Femora yellow, with variable dark markings; very large species, wing length 4.4 mm *mirifica*
— Femora black, yellow at knees; smaller species, wing length 2.4 mm *atrescens* Spencer

Liriomyza novissima Spencer, 1960, figs. 24a-b

CAPE PROVINCE: Somerset East, three ♂♂, five ♀♀, September 1930, R. E. Turner.

These specimens agree very closely with the ♀-holotype from Cape Town. The distinctive features of the species are both *vt* on yellow ground, the large discal cell and relatively short last segment of m4, which is only twice the length of the penultimate. In these further specimens the hind-margin of the eye is black for a short distance beyond the *vte*.

The ♂-genitalia have now been examined. The aedeagus is as illustrated (fig. 24a), distiphallus with distinctive, small, black ventral projections; postgonites large, toothed; surstyli apparently not differentiated; spermal sac (fig. 24b) large, dark brown, with conspicuous black base.

A single male from Natal, Drakensberg, Giant's Castle Reserve, 5,800 ft., B. & P. Stuckenberg, closely resembles this species. The coloration is similar, apart from the more extensive black on the hind-margin of the eye, so that the *vte* is on black ground. The genitalia are also generally similar, without differentiated surstyli and with a similar large, dark spermal sac; but the distiphallus appears to be somewhat smaller and lacks the two distinct black ventral processes (fig. 25). It is impossible at this stage to decide whether these differences are of specific significance.

Genus *PHYTOLIRIOMYZA* Hendel, 1931

Phytoliriomyza immoderata spec. nov., figs 26a-b

Head: frons broad, almost twice width of eye viewed from above; two *ors* directed upward, one incurved *ori*; orbital setulae minute, proclinate; third antennal segment small, rounded at end but slightly longer below, with only slight pubescence, *artista* conspicuously long. *Mesonotum*: 3 + 1 strong *dc*, third and fourth equal, *acr* slight, in two rows in front, not reaching second *dc*. *Wing*: length variable, last segment of vein *m4* twice length of penultimate or slightly less; measurements in six specimens as follows:

	Length	Proportions of penultimate and last <i>m4</i> segments
♂	1.6 mm	10 : 19
	1.75 mm	11 : 20
	1.75 mm	12 : 22
	1.9 mm	12 : 24
♀	1.5 mm	8 : 17
	2 mm	13 : 25

Colour: frons yellowish, variably darkened, becoming brown in front in some specimens; first and second antennal segments yellow, third darkened, varying from yellowish-brown to almost black; mesonotum mat grey, with trace of faint yellow striation along line of *dc*, scutellum largely grey, slightly yellow in centre; pleura largely yellow; mesopleura variably black along lower margin, pteropleura with large black triangle; legs largely yellow varying to brownish; abdomen varying from black with yellow margins to tergites to almost entirely yellow; squamae yellowish with darker borders; fringe pale; halteres yellow, knob with black patch above.

♂-*Genitalia*: aedeagus (fig. 26a) ending in short, asymmetric black tubules, mesophallus strongly chitinized, black, basiphallus relatively long, pale; spermal sac minute (fig. 26b).

♂ - Holotype: NATAL: Drakensberg, Giants Castle Reserve, 5,800 ft., 18-23.ix. 1961, B. & P. Stuckenberg; five ♂, four ♀ - paratypes, same data. Holotype and six paratypes in coll. Natal Museum, Pietermaritzburg, three paratypes in author's collection.

The type series of six males and four females from the Drakensberg is morphologically very close to the darker form of the widespread species *P. perpusilla* (Mg.) (cf. Hendel, 1936) which has been recorded in Europe, Formosa, North and South America, but the genitalia of the new species are entirely distinct. The aedeagus of *perpusilla* has recently been illustrated by Spencer (1962).

P. immoderata appears to be somewhat smaller and in particular the third antennal segment is smaller. It must now be assumed that *perpusilla* does not occur in Africa and previous records of this species from Basutoland and Natal (Spencer, 1960: 34 and 1961c: 339) no doubt refer to *immoderata*. The status of the specimen from the Cape Verde Islands (Spencer, 1959: 318) remains to be clarified.

Genus *PSEUDONAPOMYZA* Hendel, 1920

Pseudonapomyza perspicua spec. nov., figs 27a-c

Head: (collapsed in all four specimens, proportions not discernible); two short, equal, reclinate *ors*, normally three incurved *ori*; jowls deeply extended at rear; third antennal segment entirely round, arista appearing bare, fine but strongly thickened at base. *Mesonotum*: three well-developed post-sutural *dc*, *acr* irregularly in six rows. *Legs*: mid-tibia with two short but distinct lateral bristles. *Wing* (fig. 27a): length in male 1.7, in female 2 mm, costa strongly developed to vein $r_4 + 5$; costal ratio 20:10:14, second segment thus short, only one and a half times length of fourth; vein *mm* present, distinctly basad of *rm*, exactly half distance between *rm* and base of discal cell. *Colour*: frons mat black, orbits scarcely shining; antennae entirely black; mesonotum black (not grey), rather mat viewed from front, more shining from behind; pleura, legs, abdomen black, squamae dark grey, fringe black; halteres yellowish.

♂ - *Genitalia*: aedeagus as illustrated (fig. 27b, c), distiphallus long, entirely black, basiphallus irregular, more weakly chitinized, ventral appendages strongly developed; spermal sac large, as in *P. media* Spencer (1961e: fig. 21c).

♂ - Holotype: NATAL: Lebombo Mts., Jozini Dam, 2.I.1962, bred ex leaf-mine on unidentified plant, L. Vári, Ac. No. 2380; two ♂, one ♀ - paratypes, same data. Holotype and two paratypes in coll. Transvaal Museum, Pretoria, one paratype in author's collection.

This species closely resembles *P. diminua* (Spencer), 1961e, from Madagascar but this has only two *ori* and vein *mm* is only slightly basad of *rm* (Spencer 1961e: fig. 8).

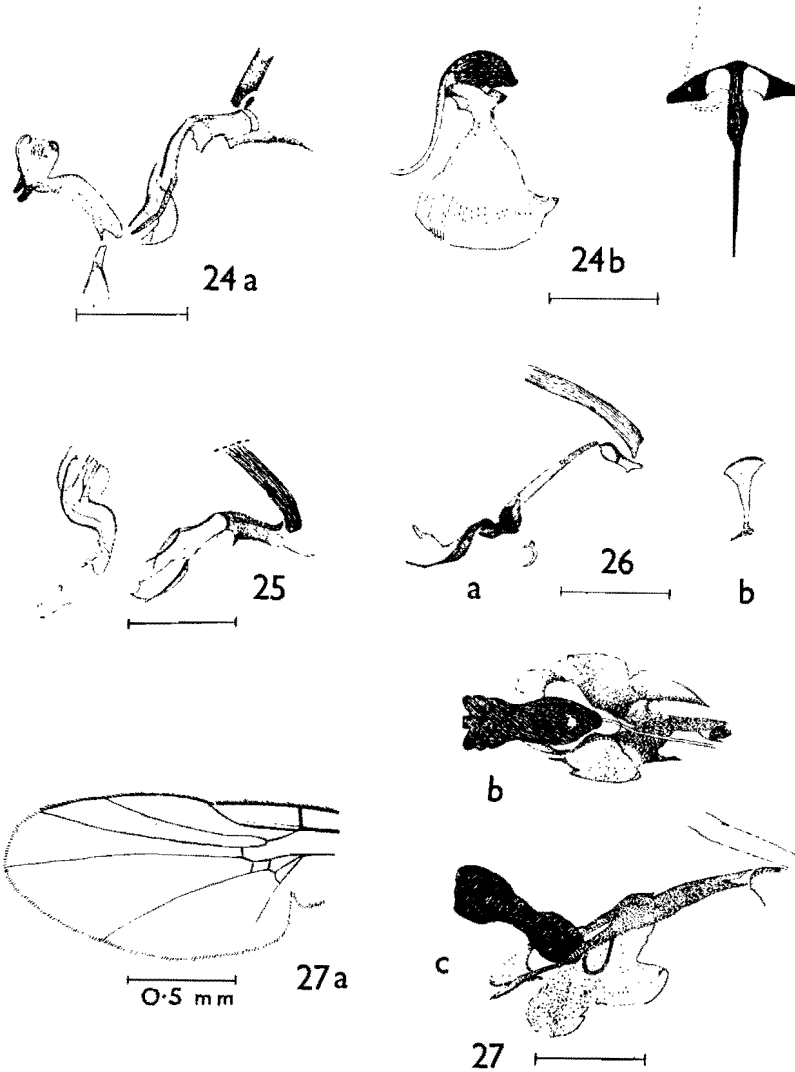


Fig. 24. *Liriomyza novissima*: a. aedeagus, side view; b. spermal sac. Fig. 25. *Liriomyza* species (Drakensberg); aedeagus, side view. Fig. 26. *Phytoliriomyza immoderata*: a. aedeagus, side view; b. spermal sac. Fig. 27. *Pseudonapomyza perspicua*: a. wing; b. aedeagus; c. aedeagus, side view.

The new species can be included in the author's (1961b) key to African *Pseudonapomyza* species by amending and extending couplet 4 as follows:

First alternative for *urundensis* (Spencer), read 4a; add new couplet:

- 4a Vein mm in continuation of or at point slightly basad of rm; second costal segment $3\frac{1}{2}$ times length of fourth; medium-sized species, wing length 2.3 mm ***urundensis*** (Spencer)
- Vein mm more distinctly basad of rm, midway between rm and base of discal cell; second costal segment shorter, $1\frac{1}{2}$ times length of fourth; small species, wing length at most 2 mm ***perspicua***

Genus *NAPOMYZA* Haliday, 1840

Napomyza drakensbergensis spec. nov., fig. 28

Head: orbits strongly projecting above eye in profile in lower half; two equal *ors* directed upwards, two slightly weaker, equal *ori* directed inwards; orbital setulae short and fine, present below lower *ors*; jowls deeply extended at rear, cheeks forming broad ring below eye; third antennal segment longer than broad, almost rectangular, arista fine, only slightly thickened at base, without any apparent pubescence, relatively long. *Mesonotum*; second, third and fourth *dc* equal, only slightly shorter than first; *acr.* irregular, in two to four rows, between fourth and second *dc*; intra-alar well-defined but weaker than second *dc*. *Wing*: length in female 3.5 mm; costal segments 2, 3, 4 in ratio 38 : 15 : 27, second cross-vein distinctly distad of first (fig. 28). *Colour*: frons, jowls and face bright yellow; orbits entirely yellow, *vte* on black ground at margin of yellow, hind-margin of eye black for short distance beyond *vte*, then yellow; first antennal segment bright yellow, second and third black; mesonotum and scutellum mat, ash-grey; humerus bright yellow, pleura black, apart from broad, yellow upper margin of mesopleura; coxae yellowish in lower half, femora broadly yellow distally, legs otherwise blackish-grey; abdomen shining black but all tergites yellow laterally and with broad, bright yellow margins; wing base yellow.

♀ - Holotype: NATAL: Drakensberg, November 1926, Van Reenen, in coll. British Museum (Nat. Hist.).

This species closely resembles the common Palaearctic species, *N. lateralis* (Fall.) (cf. Hendel, 1936) but is distinguishable by the yellow humerus, first antennal segment and coxae and by the differing position of the second cross-vein. Numerous European specimens of *lateralis* have been examined but on these characters no overlapping has been found with the new species.

The three African *Napomyza* species can be separated as follows:

- 1 Second cross-vein distinctly distad of first; humerus yellow . . . ***drakensbergensis***
- Second cross-vein in continuation of first; humerus black or grey 2
- 2 Cheeks prominent at and below base of antennae; eye conspicuously small, slanting; mesonotum moderately shining ***strana*** Spencer
- Cheeks not projecting at base of antennae; eye large, upright; mesonotum grey, matt ***munroi*** Spencer

Genus *PHYTOMYZA* Fallén, 1810

Phytomyza knowltoniae Hering, 1957

NATAL: Pietermaritzburg, Town Bush, 6.xii.1961, one ♀, K.A.S..

This specimen has been compared with the ♀-holotype bred from *Knowltonia capensis* (L.) Huth and the two agree exactly.

This species is extremely close to *P. philoclematidis* Hering, differing only in the slightly paler coloration. It seems desirable to check the male genitalia, to confirm the distinctness of the two species.

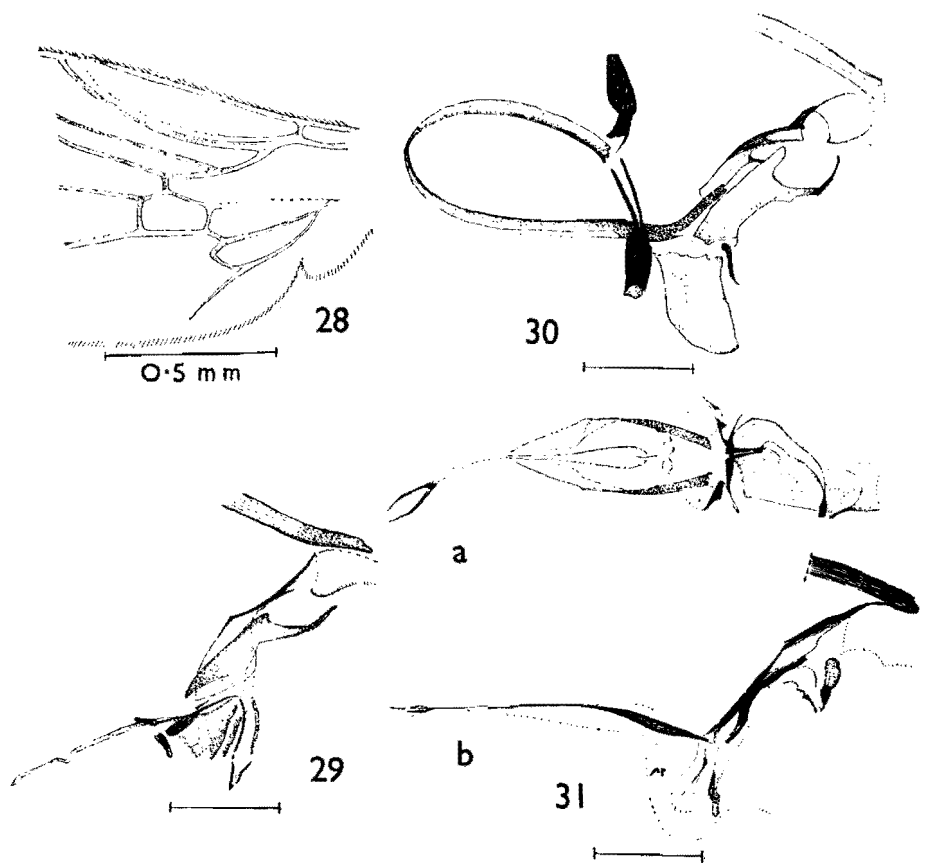


Fig. 28. *Napomyza drakensbergensis*: wing showing discal cell. Fig. 29. *Phytomyza philoclematidis*: aedeagus. Fig. 30. *Phytomyza ranunculina*: aedeagus. Fig. 31. *Phytomyza renovata*: aedeagus a. in ventral view; b. in side view.

Phytomyza philoclematidis Hering, 1957, fig. 29

TRANSVAAL: Pretoria, 29.ix.1955, bred ex leaf-mine on *Clematis brachiata* Thbg., one ♂, L. Vári. NATAL: Pietermaritzburg, Town Bush, 6.xii. 1961, empty mines noted on the same host, K.A.S..

The aedeagus of the male from Pretoria is shown in fig. 29. The distiphallus is strikingly asymmetric and entirely different from that of *P. vitalbae* Kalt, (cf. Hendel, 1936), which ends in a simple long tubule (illustrated by Spencer, in press, fig. 69). Hering (1957: 79) questioned whether *philoclematidis* might not merely represent a light form of *vitalbae* but there is now no doubt about the distinctness of the two species.

Phytomyza ranunculina spec. nov., fig. 30

Head: frons broad, twice width of eye; orbital bristles distinctive, two *ors*, the upper reduced to a slight hair, the lower short, reclinate, two short equal, incurved *ori*; orbital setulae sparse, limited to a few isolated hairs; eye distinctly slanting, jowls broad, one-third height of eye, cheeks distinctly enlarged below centre of eye; third antennal segment large, rounded at end. *Mesonotum*: 3 + 1 *dc*, with about three small hairs in front of the 4th *dc*; *acr* either entirely lacking or a few individual hairs between 4th and 3rd *dc*. *Wing*: length 2 mm; costal segments 2, 3, 4 in ratio 38 : 6 : 16. *Colour*: variable; frons, face, hind-margin of eye uniformly yellow; ocellar triangle black, isolated, with postverticals on yellow ground and a narrow strip of the upper occiput is also yellow; third antennal segment black, first and second yellow; palpi black; mesonotum variable, either with well-defined mat grey bands between the *dc*, laterad of the *dc* and also joining the supra-alar and post-alar (Abyssinia), or uniformly mat greyish-yellow, which is not broken into alternate grey and yellow bands (Natal); in both series the central area from the 2nd *dc* to the scutellum is yellow; pleura largely yellow (Natal) or sternopleura and hypopleura with distinct black area and mesopleura faintly blackish on lower margin (Abyssinia); scutellum almost entirely yellow but faintly greyish in darker specimens; legs: coxae yellow, femora largely bright yellow but slightly mottled with grey, tibiae and tarsi slightly darker, greyish-yellow or almost black; abdomen largely yellow but tergites variably blackish centrally; squamae yellow, fringe more grey.

♂-*Genitalia*: aedeagus (fig. 30) ending in long, curved tubule, which divides distally into two large, black terminal processes.

♂-Holotype: ABYSSINIA: Addis Ababa, Little Akaki River, 2300 m, 27.x.1959, bred ex leaf-mine on *Ranunculus multifidus* Forsk. 10 ♂-, and 11 ♀-paratypes: same data, all E. M. Hering; one ♂-, one ♀-paratype. NATAL: Pietermaritzburg, Town Bush, 7.xii.1961, caught on same host-plant, K.A.S. Holotype, two ♂-, four ♀-paratypes in author's collection; five ♂-, six ♀-paratypes in coll. Zoologisches Museum der Humboldt Universität, Berlin; two ♂-, one ♀-paratype in coll. British Museum (Nat. Hist.), two ♂-, one ♀-paratypes in coll. Natal Museum, Pietermaritzburg.

It was at first thought that the series from Pietermaritzburg and Addis Ababa represented two species, but males from the two areas have identical genitalia and it is clear that this is merely a case of colour variation in widely separated populations.

The species is immediately distinguishable from other known *Ranunculus* and *Clematis* feeders and also from *Phytomyza knowltoniae* Hering by the distinctive orbital bristles. It can be included in the author's key to African *Phytomyza* species (1959: 319) by adding a new couplet 7 as follows, and re-numbering the existing couplet 7 as 7a:

- 7 Orbital bristles conspicuously short, two equal incurved ori . . . **ranunculina**
 — At least lower ors and upper ori long, normal 7a

Phytomyza renovata Spencer, 1960, figs 31a-b

NATAL: Pietermaritzburg, Town Bush, 6.xii.1961, one ♂, K.A.S..

The aedeagus is shown in fig. 31a, b. The only other specimen known is the ♀-holotype from Pretoria.

Phytomyza species

NATAL: Pietermaritzburg, Town Bush, 6-7.xii.1961, three ♀♀, K.A.S..

This species closely resembles the Palearctic *P. plantaginis* R.-D. (cf. Hendel, 1936: 455) but it is believed to be distinct; clarification must wait until males are available and genitalia can be examined. The species can be included in a revised couplet 6 to the author's (1959) key, removing *anonera* Séguy from Madagascar:

- 6 *Vte* on black, *vti* on yellow ground; second antennal segment yellow; costal segments in ratio 40:15:18 **africana** Spencer
 — Both *vte* and *vti* on black; second antennal segment dark brown; costal segments in ratio 40:8:15 species (Pietermaritzburg)

Leaf-mines of unidentified species

1. *Cassia capensis* L. Rather old epidermal mines found at Hout Bay (C.P.), 26.xi.1961, K.A.S.. The only other epidermal mines known from Africa on Leguminosae are those found by the author on *Cassia bicapsularis* L. at Dakar. Without bred specimens available, it cannot be decided whether the species is one of the known epidermal miners or possibly *M. cassiae* Spencer (in press), found on *C. bicapsularis* near Sydney, Australia.
2. *Helichrysum cooperi* Harv. Upper surface linear mines common at Pietermaritzburg, Town Bush, 6.xii.1961, K.A.S. but mostly empty and no adults obtained. The species is a *Liriomyza* species.
3. *Plectranthus laxiflorus* Benth. A single, rather inconspicuous, linear-blotch mine found at Pietermaritzburg, Town Bush, 6.xii.1961, K.A.S. No adult obtained. This is possibly a *Phytobia* species.

4. *Setaria chevalieri* Stapf. Mines common at Pietermaritzburg, Cascade Falls, 7.xii.1961, but mostly empty. This probably represents an undescribed *Agromyza* species.

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